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30 November 2003

Jennifer Bjork
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Re: Phase II Review of SF Area Network

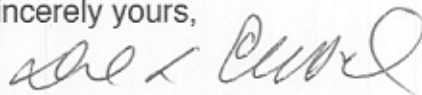
Dear Jenny:

I have completed my review of the Phase II documents for the SF (Bay) Area Network. The CD you sent me was "blank" (did not have the four files you listed), so I do not have the **Phase II reviewinstr.doc** file to write from. Instead, I have returned the hardcopy to you (with just my review responses going to Dr. Penelope Latham and copied to you here), along with my comments on the manuscript.

As I noted in earlier e-mails to you, you have done a remarkable job in both (1) effectively communicating the objectives, management needs, and goals of the Inventory and Monitoring Program, and (2) in getting to the heart of what physical processes and biological elements need to be monitored to best insure ecosystem health and the protection of key species and ecological processes.

I have very much enjoyed and learned from reviewing the Phase II document, and I look forward to continuing collaboration with you and your colleagues.

Sincerely yours,



Professor Deborah L. Elliott-Fisk

C: Dr. Penelope Latham

Attachments – review, billing invoice, manuscript (to Jenny only)

PHASE II REVIEW: San Francisco Bay Area Network (SFAN)

Reviewer: Professor Deborah L. Elliott-Fisk Date: 28 Oct. – 30 Nov., 2003
UC Davis

Documents Reviewed: SFAN Phase II Vital Signs Monitoring Plan, Working Draft (draftv9), chapters 1, 2, 3, and appendices

1. Regional requirements: All formatting was appropriate and logical. The document is well designed, with appropriate page and line numbers, headers, figures and tables.

Section I. Report Format, Logical Organization, Writing

1. Format and Outline: The organization of the document carefully follows the guidance provided in "Outline for Vital Signs Monitoring Plan." My only concern is with the overall length, which with 3 chapters is already at more than 90 pages. Information provided in the figures, tables and appendices is all very useful, and well designed. The appendices read well as written and formatted.
2. Organization of Information: The current organization is very logical and readable. I do not have any suggestions for improvement, as it is very well done. As noted previously, the figures and tables are all very useful and workable.
3. Clarity, Style and Content: The document is clearly written for the professional ecologist and park manager, as well as for the educated layperson. I found no typographical errors, and my only substantive editorial comments have to do with a few word choices for technical terms. As is frequently seen in interdisciplinary efforts like this, the most appropriate terms of earth system and ecosystem parameters and processes come from the more narrow scientific disciplines that have defined these terms. Thus, I suggest some changes based on my doctoral training in both the physical sciences and biological sciences. These suggestions are on the manuscript. As an example, all oceanography is marine, so there is no need to use the term marine oceanography; the more appropriate categorization for those vital signs is physical oceanography. As another example, the use of the term soil deposition is inappropriate. Yes, soils erode (so the term soil erosion is correct), but they do not deposit. Sediment accretion or sediment deposition is the correct term.

The use of acronyms is appropriate; they are not overused (nice job!).

4. Other comments: The final document will benefit from a well-designed layout of photos, figures and tables with the text. This draft is very good, and the document promises to be well written and designed, informative, and user-friendly.

Section II. Chapter 1 – Introduction and Background

1. "Who is interested in monitoring and why?" This question is very well addressed in the document, with the introduction here excellent and very well written. The summary of NPS policy and other legislative mandates is clear and very comprehensive. The need for partnerships with other agencies and organizations is well conceived, and the need to monitor core and outlying areas clearly addressed. NPS-wide and SFAN goals are both clearly identified and differentiated. I was very impressed with the description of the process used for input into developing this monitoring plan (see notes on mss.) and on the selection of a three-phase approach for water quality monitoring.
2. Ecological Context: The framework used in section 1.3 to present the ecological context of the parks/units within the SFAN is outstanding, carefully reviewing the settings, constraints, natural resources, and larger ecosystem management challenges. The overview is very well done, and nicely integrates with information in the tables and appendices. On p. 35, I suggest adding a new subheading to the document for marine biomes and communities. The management issues for T & E, sensitive and special status species are well outlined and referenced. The number of species on these lists presents a huge monitoring and management challenge, but is the reality of "where we are" along the California coast, with our rich biodiversity and heavy human impacts. The context of the SFAN parks/units is well portrayed regionally and nationally. I was especially impressed with the attention paid to water quality concerns (which I know the USDI-NPS WRD addresses very carefully). Both the text and appendices clearly summarize the on-going resource monitoring being done in each park/unit (I found this especially interesting).
3. Overall process: The overall process used to determine monitoring goals and objectives was very clearly described. This took some time to read through, and might be shortened, but I know the detail here is very important to park managers and administrators. The process has been very unbiased and reasonable. I am very impressed by the list of Park and non-Park scientists involved in this effort to date. The process has most definitely resulted in a comprehensive list of ecological indicators for the parks/units in the SFAN. The workshop reports were included as appendices and were very informative to review.
4. Other comments: Chapter 1 is extremely well done, nicely setting the stage for chapters 2 and 3.

Section III. Chapter 2 – Conceptual Models

1. Description of ecosystem network and parks/units drivers, stressors, structures, etc. The initial and modified conceptual models developed [identifying elements, influences (stressors), processes and outcomes] are

very well conceived and presented. I especially like the "realm" approach of terrestrial, wetland and aquatic (marine and freshwater) ecosystems. The models are conceptualized to best illustrate forcing factors and ecological linkages, and are the first step in identification of key elements, structures, and processes to measure and monitor. Spatial scales are addressed (from site to habitat patch to community to landscape), with continuing refinement of this needed, as envisioned in the next phase (see comments on mss.) What the network "did right" is outlining these multiple scales, multiple realms and looking beyond their boundaries into the larger coastal zone, watershed complex, and ecoregion. (See comments on mss.)

2. How well are basic purposes and types of conceptual models defined? The models are well-defined, with the exception of models of statistical probabilistic relationships and mathematical estimation, but then those models are often not categorized as conceptual (but as simulation models on how the ecosystem "works."). *I encourage the park scientists to work with experts to develop these simulation models as they decide what to actually measure and how to best monitor these ecosystems. There is a definite need to look at population-level models for aquatic organisms and select terrestrial organisms and food chains, with these being our best-developed models. Protection, enhancement and restoration of "species of concern" often can only be done with metapopulation models, with models of communities and ecosystems simply not derived yet, due to their inherent complexity and the short-term nature of much of our ecological data. Thus, monitoring by the parks will help develop these future, more informative ecological models.*
3. Monitoring and vital sign terms and concepts: These are clearly developed, with a couple of minor exceptions (see comments on mss., including slight modification of Figures 2.2 - 2.5 and Tables 2.1a, b, c and e).
4. Other comments: none.

Section IV. Chapter 3 – Vital Signs

1. Prioritization of vital signs – The need to prioritize the selection of vital signs is very well discussed, as is the process for their selection. On the manuscript for section 3.1 (page 81), I note that it is very important to state that some vital signs (for example, weather) will be measured/monitored over the long term (30 plus years), and not be subjected to a change in 5 years. Baseline, long-term measurements are key, as the SFAN group knows. I have several suggestions for Table 3.2, but as this documents the process used, these changes may not be possible (see comments on mss.).
2. Vital signs selected and why selected: This section is very well done and logical.
3. Criteria used and scoring: Again, clearly stated. Well done. Weighting appropriate.

4. Prioritization process: The process used is well described, and the ranking of vital signs clear. What I found myself surprised by (but I probably should not be, with the multi-disciplinary expertise and biases of scientists) is the mix of physical and biological indicators and where they ranked in the list of 63 vital signs. *I realize that this is the "ecological reality" in the region, but from both scientific and management perspectives, it makes sense to also rank the vital signs into two (if not three) groups: physical processes vs. biological elements or parameters; social elements could be a third category.* I also have suggestions about correct terminology for some of these (see comments on mss. on Table 3.3). And, although in section 3.3.4 (p. 93), the authors' note that the network's vital signs were NOT divided into distinct priority groups, *it is conceptually useful to the manager to group this long list of vital signs in to high, moderate and low priority needs.* I would want to see that if I were a Park Superintendent or Natural Resource Manager. *And I have many comments on the long Table 3.4 about correct terminology and relevant ecological hierarchy.*
5. Protocol development and the selection of specific, measurable attributes: The SFAN is not yet at the stage of selecting specific, measurable attributes, but in Table 3.4 they suggest of each indicator some attributes that could be measured (such as the compounds and particles that contribute to overall air quality). This obviously needs a lot of work in the next phase and will be key to planning and budgeting for the implementation of monitoring. The SFAN authors have a good start on this.
6. Water quality monitoring: There is a very good start of this important section too as reviewed earlier in Chapter 1 (1.3.2). I am impressed by the diversity of vital signs the SFAN is using to monitor water quality [from climatic influences to wetland function to soil erosion to watershed dynamics and the response of aquatic communities (p. 94)] – well done!
7. Other comments: None.

Section V. Synthesis Comments

1. Foundation for a scientifically credible monitoring program: The foundation for the monitoring program is very clearly presented (hence the length of the phase II document) and well justified. The experts contributing to this plan through input to the web-driven questionnaires and workshops are impressive in knowledge and breadth. It is obvious that huge amount of effort has done into the process and been fruitful, leading to a phase II document that is excellent, just needing minor refinements as the SFAN moves into the next phase. *A key part of the next phase for the parks will be the continued development of the information structure (relational database, GIS, time series of data) to track the monitoring data and use it to target management needs.*

2. Areas in greatest need of additional work: *From an ecological hierarchy perspective, I was surprised that more focus was not put on monitoring population level processes (age structure, fecundity, birth and death rates), vs. community, landscape and ecosystem level vital signs. We need to measure at all of these levels, and we are best at measuring and modeling the population level elements and processes. And I say this being an ecosystem level, big picture scientist! I also suggest the development of clear protocols for the measurement of physical vs. biological vs. social (e.g., human perception, human needs) vital signs. Yes, these need to be integrated in the models, but they are most clearly articulated as to their mechanism.*
3. Additional comments: *Keep up the excellent work. To have a monitoring program like this in our national parks is exciting and a model for us to follow elsewhere!*